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IN THE CLAIMS:

The following is a complete listing of claims in this application.

1. (currently amended) A die coating for use on the surface of a metal mold or metal die component contacted by molten metal in low pressure or gravity die casting, said die coating including a porous thermal barrier layer of ceramic material produced by co-deposition, using a thermal spraying procedure, of a powder of said ceramic material and a powder of an organic polymer material and, after the co-deposition, heating said co-deposited layer on the mold or die component to remove the polymer material, and provide said porous layer of ceramic material, said porous thermal barrier layer of ceramic material having a thickness of about 250 to 400 μm.

2. (previously presented) A die coating according to claim 1, wherein said ceramic powder is at least one ceramic powder selected from the group consisting of oxides, nitrides, carbides and borides.

3. (previously presented) A die coating according to claim 1, wherein said ceramic powder is at least one mineral compound powder selected from the group consisting of clay minerals, hard rock ore and heavy mineral sands.

4. (previously presented) A die coating according to claim 3, wherein said ceramic powder is obtained from scoria or pumice.

5. (previously presented) A die coating according to claim 1, wherein said organic polymer powder is formed from a thermoplastic material.

6. (previously presented) A die coating according to claim 1, wherein each of said ceramic and polymer powders is of relatively narrow size spectrum.

7. (previously presented) A die coating according to

claim 6, wherein said ceramic and polymer particles are of particle sizes not more than about 60 μm and not less than about 1 μm in the case of said ceramic powder and not less than about 5 μm and not more than 45 μm in the case of the polymer powder.

8. (currently amended) A process for providing a die coating on the surface of a metal mold or metal die component, comprising the steps of forming an initial coating of organic polymer material and ceramic material on the surface by co-deposition of powders of the materials by a thermal spraying procedure, and heating the initial coating to a temperature of less than 450°C so as to remove the polymer material and leave a coating of ceramic material with voids therein, thus forming a porous thermal barrier coating of the ceramic material.

9. (previously presented) A process according to claim 8, wherein said polymer material is removed by combustion and/or decomposition.

10. (previously presented) A process according to claim 8, wherein said thermal spraying procedure is either flame spraying, plasma spraying or electric arc spraying.

11. (previously presented) A process according to claim 8, wherein a substantially uniform die coat is provided over all surfaces of the mold or die components, which define a die cavity.

12. (previously presented) A process according to claim 11, wherein said coating has a thickness of from about 250 to 400 μm.

13. (previously presented) A process according to claim 12, wherein said coating has a thickness of from about 300 to about 400 μm.

14. (previously presented) A metal mold or die component

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having a surface for contact by molten metal in low pressure or gravity die casting, said surface being coated fully, or in a section or sections thereof, by a die coating according to claim 1.

Claims 15-17 (canceled).

18. (previously presented) A die coating according to claim 5, wherein said thermoplastic material is selected from the group consisting of polystyrene, styrene-acrylonitrile, polymethacrylates, polyesters, polyamides, polyamide-imides and PTFE.

19. (previously presented) A die coating according to claim 2, wherein said ceramic powder is at least one ceramic powder selected from the group consisting of alumina, titania, silica, stabilized zirconia, silicon nitride, boron nitride, silicon carbide, tungsten carbide, titanium borides and zirconium boride.

Claim 20 (canceled).

21. (previously presented) A die coating according to claim 3, wherein said ceramic powder is at least one mineral compound powder selected from the group consisting of ilmenite, rutile and zircon.

22. (previously presented) A metal mold or metal die component having a surface for contact by molten metal in low pressure or gravity die casting, said surface being coated in a section or sections thereof with a non-porous ceramic die coating and in another section or sections thereof, with a die coating including a porous thermal barrier layer of ceramic material produced by co-deposition, using a thermal spraying procedure, of a powder of said ceramic material and a powder of an organic polymer material and, after the co-deposition, heating said co-deposited layer on the mold or die component to remove the polymer material, and provide said porous

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thermal barrier layer of ceramic material having a thickness of about 250 to 400 μm.

23. (currently amended) A metal mold or metal die component having a surface for contact by molten metal in low pressure or gravity die casting, said surface being coated fully, or in a section or sections thereof, by alternating layers of a non-porous ceramic die coating and a die coating including a porous thermal barrier layer of ceramic material produced by co-deposition, using a thermal spraying procedure, of a powder of said ceramic material and a powder of an organic polymer material and, after the co-deposition, heating said co-deposited layer on the mold or die component to remove the polymer material, and provide said porous thermal barrier layer of ceramic material having a thickness of about 250 to 400 μm.

24. (previously presented) A die coating according to claim 1, wherein the heating is to a temperature of up to 450°C to remove the polymer material.

25. (previously presented) A die coating according to claim 7, wherein the heating is to a temperature up to 450°C to remove the polymer material.

26. (currently amended) A die coating for use on the surface of a metal mold or die component contacted by molten metal, said die coating including a porous thermal barrier layer of ceramic material produced by co-deposition, of a powder of said ceramic material and a powder of an organic polymer material using thermal spraying procedure followed by heating said co-deposited layer to a temperature up to 450°C to remove the polymer material, and provide said porous thermal barrier layer of ceramic material having a thickness of about 250 to 400 μm.

27. (currently amended) A process for providing a die

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coating on a surface of a metal mold or die component comprising the steps of:

co-depositing powders of an organic polymer material and powders of a ceramic material on the surface of the metal mold or die component by a thermal spraying procedure;

heating the metal mold or die component to a temperature up to 450°C to remove the polymer material and leave a porous thermal barrier coating of the ceramic material having a thickness of about 250 to 400 μm.

28. (currently amended) A coated metal mold or die component including a porous thermal barrier layer of ceramic material formed by co-deposition of a powder of said ceramic material and a powder of an organic polymer material, and heating the co-deposited layer to a temperature of up to 450°C to remove the polymer material, and provide said porous thermal barrier layer of ceramic material having a thickness of about 250 to 400 μm.

29. (previously presented) The coated metal mold or die component of claim 28, wherein the ceramic material is at least one material selected from the group consisting of oxides, nitrides, carbides and borides.

30. (previously presented) The coated metal mold or die component of claim 29, wherein the ceramic material is at least one material selected from the group consisting of alumina, titania, silica, stabilized zirconia, silicon nitride, boron nitride, silicon carbide, tungsten carbide, titanium borides and zirconium boride.

31. (previously presented) The coated metal mold or die component of claim 28, wherein the ceramic material is at least one mineral compound or heavy mineral sand selected from the group consisting of clay minerals, hard rock ore, ilmenite, rutile and zircon.

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32. (previously presented) The coated metal mold or die component of claim 28, wherein the ceramic material is obtained from scoria or pumice.

33. (currently amended) A die coating for use on the surface of a metal mold or metal die component contacted by molten metal in low pressure or gravity die casting, said die coating including a porous layer of ceramic material produced by co-deposition, using a thermal spraying procedure, of a powder of said ceramic material having a particle size of 1-60 μm and a powder of an organic polymer material having a particle size of 5-45 μm and, after the co-deposition, heating said co-deposited layer on the mold or die component to remove the polymer material, and provide said porous layer of ceramic material.

34. (previously presented) A die coating according to claim 33, wherein said ceramic powder is at least one ceramic powder selected from the group consisting of oxides, nitrides, carbides and borides.

35. (previously presented) A die coating according to claim 33, wherein said ceramic powder is at least one mineral compound powder selected from the group consisting of clay minerals, hard rock ore and heavy mineral sands.

36. (previously presented) A process for providing a die coating on the surface of a metal mold or metal die component, comprising the steps of forming an initial coating of organic polymer material, the polymer material having a particle size of 5-45 μm and ceramic material on the surface by co-deposition of powders of the materials by a thermal spraying procedure, and heating the initial coating so as to remove the polymer material and leave a coating of ceramic material with voids therein, thus forming a porous coating of the ceramic material.

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37. (previously presented) A process according to claim 36, wherein said polymer material is removed by combustion and/or decomposition.

38. (previously presented) A process according to claim 37, wherein a substantially uniform die coat is provided over all surfaces of the mold or die components, which define a die cavity.

39. (previously presented) A process according to claim 38, wherein said coating has a thickness of from about 250 to 400 μm.

40. (previously presented) A metal mold or metal die component having a surface for contact by molten metal in low pressure or gravity die casting, said surface being coated fully, or in a section or sections thereof, by a die coating according to claim 33.

41. (new) A die coating according to claim 1, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

42. (new) A die coating according to claim 1, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10 μm.

43. (new) A process according to claim 8, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

44. (new) A process according to claim 8, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10 μm.

45. (new) A metal mold or die component according to claims 23, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the

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molten metal in low pressure or gravity die casting.

46. (new) A metal mold or die component according to claims 23, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10μm.

47. (new) A coated metal mold or die component according to claim 28, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

48. (new) A coated metal mold or die component according to claim 28, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10μm.

49. (new) A die coating according to claim 26, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

50. (new) A die coating according to claim 26, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10 μm.

51. (new) A process according to claim 27, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

52. (new) A process according to claim 27, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10 μm.

53. (new) A die coating according to claim 33, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

54. (new) A die coating according to claim 33, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10 μm.

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55. (new) A process according to claim 36, wherein the porous thermal conducive barrier layer forms the outer surface of the coating that contacts the molten metal in low pressure or gravity die casting.

56. (new) A process according to claim 36, wherein the surface roughness R_a of the porous thermal conducive barrier layer is at least 10 μm.

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